

CONTRIBUTIONS TOWARD A MONOGRAPH OF THE NOCTUIDÆ OF
BOREAL AMERICA. REVISION OF THE DICOPINÆ.

BY

JOHN B. SMITH, SC. D.

Under the title *Dicopinae* Mr. Grote, in the Proc. Am. Phil. Soc., XXI, 154 (1883), separates a few species which seem to form a tolerably natural group, without being really entitled to subfamily rank. The species agree in having naked, more or less obviously lashed eyes, a robust, heavy thorax, but proportionately small, conic abdomen. The thoracic vestiture is dense, usually thick, sometimes coarse, never forming defined tufts, though there is usually a massing of the vestiture posteriorly. The head is somewhat retracted, sometimes quite obviously so, the tongue is weak and short, the palpi are small, not reaching or scarcely exceeding front, and the male antennæ are bipectinated. The tibiæ are not spinulose; but the anterior pair is armed with a stout, curved, corneous claw at tip. The anterior femora are quite stout, thicker than usual. Altogether the species have a bombyciform appearance, negatived principally by the short, narrow, pointed primaries of most of the forms. The venation is normally noctuidous except that in the secondaries the cell is unusually long and the furcation of the subcostal unusually near the outer margin. Three genera are recognizable, two of them rather illy defined, the third habitally more than structurally different.

Dicopis, the type of the group, has coarse, scaly vestiture, projecting straight forward on the front, giving it a scrubby, brush-like appearance. The head is slightly retracted and the abdomen has a series of more or less obvious dorsal tufts.

Eutolyte is rather narrower winged than the preceding, the abdominal tufts weak or entirely wanting. The thoracic vestiture is finer and smoother, and the frontal vestiture is smooth, even, and more woolly in appearance. The head is somewhat more prominent, forming an even cone from the crown of the collar to the front. The shape of the head and the character of the vestiture are really the only distinctive features, and that they are not striking is shown by the fact that Mr. Grote kept the species together, separating only *rolandi* by the tuft of metallic scales at the base of thorax.

Copipanolis is a rather well-marked genus in which the wings are usually wider, more trigonate, the outer margin longer. The head is more strongly retracted and the thoracic vestiture fine, loose, and di-

vergent, giving the insect a plump, more bombycid habitus, emphasized by the more broadly pectinated male antennæ. The wings are rusty red brown or carneous gray, and powdery, so as to make them appear thinly scaled.

Although I know autoptically all save one of the species in this series (*viridescens* Wlk.), I have not given the sexual characters, partly because I have not had sufficient material of some species, and partly also because the characters in the forms examined are so simple as to be of little or no value in the separation of the species. In all there is a simple oblong harpe, near the center of which there is a small, corneous beak-like clasper.

None of the species are really common, and of those of which I have dates of capture all make their appearance very early in the season—a fact that may explain their rarity because they have disappeared when collecting usually begins. Mr. Grote makes the statement that they hibernate in the Chrysalis state.

DICOPIS Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci., App. 23.

1882. Smith, Bull. BkIn. Ent. Soc., v, 20.

Copivaleria Grt.

1883. Grt. Pr. Am. Phil. Soc., XXI, 168.

In this genus the thorax is square, the patagiæ rather sharply defined, the primaries with the apices more marked. The character of the frontal vestiture has been already noted.

Three species, *grotei*, *muralis*, and *thaxterianus* are referable here.

Grotei is a dark, blackish gray species, with squammose or roughly clothed wings, the markings indefinite, the reniform usually white and contrasting, the s. t. space concolorous in all the specimens I have seen.

This species was first described as a *Valeria* by Mr. Morrison, a genus of which I have seen no American species as yet. I called attention to the erroneous reference in my synopsis of noctuid genera, and Mr. Grote suggested the term *Copivaleria* for the species, distinguishing it by the longer, more pointed, wings from *Dicopis*. The difference however does not exist, and I can find no safe points for distinguishing the genus.

Muralis is smaller, varying from a rather light ash to dark blackish gray, never as deep as in the preceding. The maculation is always traceable, and sometimes sharply defined. The reniform is large, better defined, and not so contrasting as in *grotei*. The s. t. space is usually more or less white, prominently interrupted in the submedian interspace by a black streak, which is often connected through the median space with the prominent basal dash.

Thaxterianus is the smallest of the species, in type of maculation like *muralis*, but quite evenly brown to the t. p. line, beyond which the ter-

minimal space is whitish, powdery. There is not, in the specimens examined by me, any black dash opposite anal angle.

Electilis, if a *Dicopsis* at all, belongs to this series and stands next to *muralis*, to which Mr. Morrison makes it "distantly" related.

Viridescens Wlk. is also probably a very near relative of *muralis*.

In synoptic form the species known to me autopically, are as follows:

A black dash in terminal space opposite anal angle.

Blackish, vestiture rough; lines incomplete, not well marked, reniform contrasting, white GROTEI.

Gray, varying in tint; vestiture less rough; lines complete, usually well marked, reniform not contrasting MURALIS.

No black dash in terminal space opposite anal angle, brown to the t. p. line, terminal space whitish THAXTERIANUS.

Dicopsis grotei Morr.

1874. Morr. Bull. Buff. Soc. Nat. Sci., I, 274, *Valeria*.

1882. Smith, Bull. Bkln. Ent. Soc., V, 44, an *Valeria*?

1883. Grt., Proc. Am. Phil. Soc., XXI, 146, 163, *Copivaleria*.

Head and thorax blackish or deep dark brown. A little tuft at base of antennæ whitish. Disk of thorax quite densely, of patagiæ sparsely white powdered, the latter with a black submarginal line. Primaries blackish or dark smoky gray, with mossy green shadings, unequally and somewhat inconstantly distributed over the surface. T. a. line geminate, black, outwardly oblique, irregular, variably distinct. A curved black basal dash looped beyond the t. a. line to form a broad claviform. Over this streak and in the claviform the wing is sometimes more or less white powdered. T. p. line geminate, black, irregular, fairly distinct, widely outcurved over the reniform, then deeply indrawn, touching the reniform inferiorly, reaching the inner margin opposite the space between the ordinary spots. A blackish median shade between the ordinary spots reaching the inner margin at about its middle. Beyond this shade extends a white blotch along the inner margin becoming bluish beyond the t. p. line, which is here emphasized and brought out prominently. S. t. line broken, irregular, mossy green or yellowish, with a deep inward sinus on vein 2, below which it is prominent and on which it is crossed by a black dash. Veins more or less evidently black marked. A broken terminal black line marked by blue powderings around the veins. Orbicular round, moderate in size, concolorous, with a whitish central dot and a whitish annulus which are sometimes indistinct. Reniform large, diffuse, usually white, contrasting. Secondaries white, black powdered on the veins and over the outer margin beyond a broken extra median line. Discal spot of underside visible above. Beneath soiled white with variably diffused black powderings, most obvious on the primaries. A more or less obvious outer line and distinct discal spot on all wings.

Expands 39 to 41 millimetres = 1.56 to 1.64 inches.

HABITAT: Eastern and Middle States to the Mississippi. Cambridge, Mass., April 26; Newtonville, Mass., May 12; Illinois.

Six specimens are in the Museum collection (Acc. 20395 and collection of O. Meske), from which the above description was made. The antennæ are yellowish. The color varies considerably in intensity, and fresh specimens have the mossy green tint most distinct. The transverse lines are not usually all traceable, while the large indefinite discolorous reniform is always evident and usually prominent, contrast-

ing. The white and blue patch on the inner margin beyond the median shade is also obvious in all specimens. The species seems not rare locally; but there are usually not many in collections.

Dicopis viridescens Wlk.

1865. Wlk., C. B. Mus. Suppl., 32, 601, *Cymatophora*.

1868. Grt. and Rob., Trans. Am. Ent. Soc., II, 86, *Hadena*.

1882. Grt., Ill. Essay, 40, *Dicopis*.

“*Male*.—Green, cinereous beneath. Proboscis slender. Palpi porrect, pilose, not extending beyond the head. Antennæ tawny, moderately pectinated. Tegulæ of the thorax bordered with black and with whitish. Abdomen cinereous, extending rather beyond the hind wings. Fore wings black speckled; orbicular and reniform marks large, whitish, partly black bordered; an exterior whitish band interrupted near the internal angle by a broad green streak, which contains two little black lines; two black lines, one extending from the base, the other angular and proceeding from the costa, both joining a whitish, black-bordered spot which is behind the orbicular; marginal points black. Hind wings dingy, cinereous; veins blackish towards the exterior border; under side with a black spot in the disk and an exterior blackish denticulate line. Length of the body 6 lines; of the wings 16 lines.

This species has some resemblance to *C. ridens*, but is most allied to *C. caniplaga*, and with it may form a new genus.”

a. Florida. Presented by E. Doubleday, Esq.

It is not impossible that this is a form of *muralis*. The description fits it fairly well, but it would need Floridan material more closely agreeing with Walker's characterization to enable the reference to be definitely made. Mr. Grote's correction of the generic reference has alone made this suggestion possible, and he himself says it is “close to *D. muralis*, while smaller.”

[Since the above was sent to the printer I have seen the type in the British Museum and find it to be *muralis* without a doubt.]

Dicopis muralis Grt.

1874. Grt., 6th Rept. Peab. Acad., App., 23, *Dicopis*.

1874. Grt., Bull. Buff. Soc. Nat. Sci., II, Pl. i, Fig. 1.

Ash gray varying to dark, smoky, or even blackish gray, in pale specimens with faint greenish washes. T. a. line geminate, black, with paler included spaces, quite usually subobsolete. A usually prominent black basal dash, looped beyond the t. a. line to form the claviform, which is broad and white powdered. Below this dash the basal space is white powdered. T. p. line geminate, quite acutely projected outwardly below costa, inwardly oblique, irregular, forming an acute angle on vein 2, and there almost reaching the claviform. Beyond this line the wing is usually white powdered, the s. t. line defined by the contrast between the dark terminal and paler subterminal spaces, cut in the submedian interspace by a prominent black dash. Sometimes the color is more even, and the s. t. line is then a broad, irregular, indefinite white line, cut as before opposite the anal angle. A row of black terminal dots, fringes also tipped by a broken brown line. Orbicular large, round, slightly paler, annulate, with whitish gray. Reniform large, pale, whitish, with a fuscous inner lunule, usually fairly well defined. A vague, irregular median shade between ordinary spots and following the angulations of the t. p. line. Secondaries somewhat fuscous gray, powdery, with discal lunules, variably complete extra dis-

cal line and distinct series of terminal lunules blackish. Beneath fuscous powdery over gray, primaries darker, secondaries with a broad outer line and distinct discal spot. Head and thorax concolorous with primaries, patagiæ with black submarginal line.

Expands 35 to 39 millimeters = 1.40 to 1.56 inches.

HABITAT: Middle States to the Mississippi and Texas. New York, (Brooklyn); Pennsylvania (Philadelphia); Illinois (Champaign); Central Missouri in April; Texas March 21.

Four specimens are in the national collection (collection of C. V. R., and Belfrage, and Acc. 20395) from which the foregoing description was made. The species is wider winged and as a whole smaller than the preceding, with the same general style of maculation. It varies in ground color and in distinctness of maculation, but most prominently perhaps in the s. t. line, which sometimes becomes a broad whitish shade. The large reniform is always distinctly paler, but not, in my experience, contrasting.

The species is not common.

Dicopsis electilis Morr.

1875. Morr., Proc. Bost. Soc. N. H., xviii, 114. *Dicopsis*.

"Expanse 37 millimetres. Length of body, 14 millimetres.

Palpi short, scarcely exceeding the front. Antennæ of the male "pyramidal toothed, (this is a term used by Lederer). Anterior tibiæ with a long slender claw, otherwise unarmed. Thorax heavy and with coarse villosity; a distinct white band on each side of the tegulæ, which are black next to the wings. Abdomen short, dark and not untufted. Anterior wings cinereous gray, with the markings well defined; a very heavy black basal streak, including and extending beyond the claviform spot to the exterior line; ordinary spots concolorous, obsoletely encircled with black; interior line obsolete; exterior line distinct, black and narrow, with an indentation opposite the reniform spot, below which it is drawn in; subterminal line blackish, subobsolete. Posterior wings light gray; beneath gray, the posterior wings lighter, with discal dots.

Hab. Easton, Pennsylvania. From Mr. W. H. Stultz."

"Distantly allied to *Dicopsis muralis* Grt.; it differs in the shape of the wings, which are narrow and *Cucullia*-like, the presence of the basal streak extending to the exterior line, and the absence of the distinct sub-anal streak of *muralis*."

There is a badly rubbed specimen, I believe in the Tepper collection, marked "type" by Mr. Morrison, in which the basal dash is broad and suffused; but I did not otherwise compare it with the description. The statement that the abdomen is "not untufted" excludes the species from *Eutolype* to which the species commonly known as *electilis* is best referred. The character found in the longitudinal dash extending from base to the t. p. line is a strong one, and should render the species recognizable. The term "pyramidal toothed" is used by Lederer for that form of antennæ in which the lateral processes are small, conic, and less than serrate. This does not agree with the character of the group, and Morrison either did not have a male, or the species may

not belong to this series at all. Mr. Grote has also seen the type and suggests that it seemed to him close to *muralis*.

Dicopis thaxterianus Grt.

1874. Grt. Buff. Bull. II, 196, *Dicopis*.

1881. Grt., Papilio I, 48, *Dicopis*.

“♂. The tibial claw is present, and the testaceous antennæ are bipectinated, somewhat less heavily so than in *D. muralis*. The colors are mainly those of *D. muralis*, but the wings are more uniformly fuscous to the subterminal line, and then the terminal space contrasts by its frosty, grayish white. Fringes distinctly checkered, fuscous and white; with the terminal line nearly obsolete, not resolved into black dots as in *D. muralis*. Ordinary spots ill defined, whitish, the reniform inwardly sharply margined with black, smaller than in *D. muralis*; orbicular rounded, black edged. Claviform quite small, concolorous, black edged, removed from the orbicular, hence very different from that of *D. muralis*. A fine basal black ray. No black streak above internal angle, and no black shading across the median space opposite the claviform. The median lines are distinctly marked with black, in general shape resembling those of *D. muralis*, but differing in slight details. The primaries are more pointed than in *D. muralis*, narrower and with the external margin more oblique, straighter and a little depressed before internal angle. Hind wings smaller, pale fuscous with traces of a double line on the veins, and with the faint terminal line not broken into points. Beneath much as in *D. muralis*; on the hind wings the discal mark is larger and tends to fuse with the median line, the latter exerted at this place, so that a fuscous O may be more or less completely outlined by the line and the discal lunate mark. Thorax hoary gray, the tegulæ black lined.

“Expanse, 35 millimetres. Taken April 8, 1874.”

HABITAT: Massachusetts, Texas.

This species seems rare. I have seen but few specimens, and these showed little variation. It is smaller throughout than *muralis* and, as Mr. Grote says in the description quoted, the wings are narrower and lack the transverse line crossing the median space.

EUTOLYPE Grt.

1874. Grt., Pr. Ac. N. Sci., 1874, 198.

1882. Smith, Bull. Bkln. Ent. Soc., v, 21.

1883. Grt., Pr. Am. Phil. Soc., XXI, 154.

Four species seem referable to this genus—*bombyciformis*, *rolandi*, *depilis*, and *damalis*, all easily separated.

Bombyciformis is dark gray as a rule, with a black basal dash which meets the t. a. line from costa in an easy curve, and incloses a triangular space which in pale specimens is marked with rusty red brown. The s. t. line is usually distinct, most prominent and whitish opposite the anal angle, where it is marked with a blackish brown patch. The disk of the patagiæ is discolorous, pale gray.

Depilis is an ashy gray species in which all the markings are lost, save that the s. t. line is traceable and forms a whitish lunule in the submedian interspace. The ordinary spots are more or less completely defined by a narrow black line, and the space between them is very slightly darker.

In both of these species the costa is more convex than in any of the other species.

Damalis is a fine bluish gray species in which all the markings are written in narrow, slightly darker lines, and the s. t. line is not pale.

Rolandi is the smallest of the species of a dark, smoky, ash gray, the maculation barely traceable, but agreeing with *damalis* so far as it is visible. In fresh, perfect specimens the scales forming the loose, posterior thoracic tuft are chalybeus or metallic steel-blue, and from this character Mr. Grote derived his generic term, seeing in it a resemblance to the Bombycid genus *Tolype*.

In tabular form the species divide as follows :

S. t. line pale, distinct at least in s. m. interspace.

Dark gray, patagiæ discolorous gray ; basal dash and t. a. line united, distinct..
BOMBYCIFORMIS.

Pale, bluish gray, all the lines obsolete, ordinary spots traceableDEPILIS.

S. t. line dusky, more or less broken.

Very bright bluish gray, all the markings well written, size larger.....DAMALIS.

Dark smoky gray ; all the markings subobsolete, size smaller.....ROLANDI.

Eutotype bombyciformis sp. nov.

Head and thorax dark gray, varying to almost number brown. Front reddish inferiorly. Disc of patagiæ paler, somewhat contrasting, blackish margined. Primaries varying from dark ash gray to blackish, the maculation almost obsolete in the dark forms. Basal line indicated in pale specimens. T. a. line dusky, obsolete, geminate, distinct to the basal black dash, which is here curved, hook-shaped, indicating the claviform and united to the t. a. line, together inclosing the upper part of basal space. In pale specimens the basal dash is marked with rusty red, recalling certain species of *Notodonta*. T. p. line faint, single, widely exerted over reniform, very irregular, and reaching the inner margin just within the s. t. line, where it is also best marked. S. t. line lunulate, black, followed by whitish or yellowish powderings, sometimes all obsolete, save a white lunule opposite anal angle, complete only in pale specimens. Orbicular round, very little paler, narrowly black ringed. Reniform large, upright, somewhat constricted centrally, with a broad vague pale annulus, inwardly emphasized with black. Secondaries whitish to smoky, darkest outwardly, with a faint outer line and discal lunule. Beneath varying from gray to smoky brown on primaries ; paler, with an outer line and discal lunule on secondaries.

Expands 37 to 40 millimetres = 1.48 to 1.60 inches.

HABITAT : Ohio ; Illinois ; Missouri.

Four specimens are in the Museum collection (collection of C. V. R., J. B. S., and Acc. 20395), one of them marked No. 490, March 11, 1874, from the Riley collection.

This is the species which I had seen marked *electilis* Morr., in collections, and which I have so named on the faith of these determinations ; but comparing the specimens at hand with the description, it is simply impossible that Morrison could have had similar examples before him.

Where the original erroneous determination came from I do not know, nor do I know where Morrison's type is to be found.

The small series before me shows quite a decided range of variation,

from the dark form in which the maculation is barely traceable to the bright bluish gray specimens in which every detail is evident, and the markings are additionally emphasized by rusty red brown scales. The Illinois specimen (Acc. 20395) came from the State Laboratory of Natural History at Champaign, and was named *Dicopis electilis* for them.

Eutolype depilis Grt.

1881, Grt., Papilio I, 48, *Dicopis*.

"♂ Smooth, dark gray in color, recalling *Eutolype Rolandi*, but without the metallic tuft of scales on the thorax behind which separates *Eutolype* from *Dicopis*. Interior line fine, black, projected opposite the claviform spot. Claviform with a tinge of yellowish, moderate, somewhat rounded and incompletely ringed with black. Orbicular, spherical, concolorous gray, with a paler ring edging the faint annulus within. Reniform similar, very large, medially constricted. Outer line fine, irregular, wavy, much removed outwardly. There is a flecking of yellowish outside of the fine sub-terminal line, which runs very close to the outer median line, at inner angle. Hind wings whitish, with gray shaded edging and fringes; beneath, with dot and line. Head and thorax dark gray. Size of *Muralis*, or perhaps a little larger and seemingly stouter. Columbus, Ohio.

"* * * Finally, I have a female specimen from Texas, collected by Belfrage, which comes near to *Depilis*, but may prove a distinct species; it is numbered 697."

The above is Mr. Grote's original characterization. Two female specimens are before me, agreeing with the description save for a somewhat paler ground color, very indistinct markings and slightly darker shade between the ordinary spots. Both are from Texas, collected by Belfrage, dated March 21; one of them was given me by Mr. Grote himself, is labeled *Dicopis depilis* in his own handwriting, and is probably the specimen referred to in his description. The other is from the Belfrage material in the Riley collection, and is numbered 697 on a red label. The label would indicate that Mr. Grote concluded that the Texan specimens were not distinct from the Ohio type, and I have no doubt he is correct. I have also seen the species from New York State.

Eutolype rolandi Grt.

1374. Grt., Proc. Acad. Nat. Sci., XXVI, 198, *Eutolype*.
vernalis Morr.

1874. Morr. Proc. Bost. Soc. N. H., XVII, 133, *Copipanolis*.

1875. Grt., Can. Ent., VII, 17, pr. syn.

1875. Grt., Bull. Buff. Soc. N. Sci., II, 210, pr. syn.

Dark ash gray, sometimes almost blackish. Head and thorax usually a little darker, patagiæ indistinctly blackish margined, disc with a posterior tufting of metallic bronze brown scales, which lose their luster in old specimens. Primaries with the maculation vague, indefinite, the median lines barely traceable, sometimes entirely obsolete. T. a. line geminate, rather evenly oblique outwardly. T. p. line apparently single, its course much as in *muralis* as far as traceable. A faint nearly upright median shade is perceivable in some specimens. S. t. line always marked as a series of blackish dots, sometimes becoming nearly connected, and often relieved by a sparse powdering of greenish white scales. The claviform is not traceable in any of my specimens. Orbicular moderate, round, concolorous, imperfectly black ringed, usually marked by an annulus of pale yellowish scales, rarely almost obsolete. Re-

niform large, upright, slightly constricted in the middle, concolorous, incompletely marked with darker scales and often by paler yellowish white atoms. Secondaries whitish, densely dark powdered, with a distinct blackish marginal line and a faint discal lunule. Beneath gray, powdery, primaries with disc darker, secondaries paler, with an outer line and discal lunule.

Expands 31 to 35 millimetres = 1.24 to 1.40 inches.

HABITAT: Massachusetts, April 8 to 15; Missouri, April and May; Texas, February 17 to 26.

Nine specimens, all males, and all save one from Texas (Belfrage in collection of C. V. R.), are before me. I have seen a number of other specimens and there is very little variation save in the distinctness of the maculation. As a rule the punctiform s. t. line is quite distinct and usually also the ordinary spots are evident. In fresh specimens the metallic shining scales at base of thorax constitute an unfailing index to the species; but in old specimens or when they show even a slight tendency to grease, the metallic luster disappears, and the genus as based on this character becomes irrecognizable.

Eutotype damalis Grt.

1880. Grt., Bull. U. S. Geol. Surv., v, 208, *Dicopis*.

1881. Grt., Papilio, i, 49, *Dicopis*.

“♂. Fore tibiæ each with a long black claw; eyes naked; antennæ testaceous, bipectinate. Clear, bluish gray. Ornamentation of primaries feebly written. Orbicular round, reniform narrow, curved, upright; the lines are double, and with the spots indicated by pale brown shade lines, all concolorous with the wings. Thorax shaggy, bluish gray. Hind wings whitish, a little soiled, with discal dot, faint terminal lines, and whitish fringe. Beneath white, with black discal spot and broken black mesial line. Fore wings gray, with faint broad exterior shade line. Feet and abdomen gray. Expanse 34 millimetres.”

HABITAT: Havilah, Cal.; Alameda, Cal.

This is a well-defined species most nearly related to *rolandi*, but larger, somewhat wider winged, a fine pale bluish gray in color, and lacking all trace of the metallic scales.

COPIPANOLIS Grt.

1874. Grt., 6th Rept. Peab. Acad. Sci., App., 25.

1882. Smith, Bkln. Bull., v, 21.

1883. Grt., Proc. Am. Phil. Soc., XXI, 154.

This genus is distinguished from the others of the group by the thin long hairy vestiture of thorax, forming no obvious tufts, by the brownish red or gray colors, the wings powdered with darker brown atoms and appearing more thinly scaled, and by the generally more bombycid habitus of the species.

Only one species was known for sixteen years, but I have now recognized four very distinct forms, separable as follows:

Borealis, a new species, differs from all the others in color, the head, thorax and median space of primaries umber brown, the basal and

extra medial space of primaries pearl gray. The median lines are well defined, the ordinary spots obvious and secondaries black.

All the other species are reddish brown in color, the secondaries paler than the primaries.

Cubilis, the type of the genus, has the median lines distinct, diffuse, the ordinary spots more or less obviously discolorous, the terminal space paler than the rest of the wing, s. t. space brownish.

Fasciata is the common Texan species that usually does duty as *cubilis* in collections, but can not well be that species. The color is always uniform, the lines are broad and distinct, and the ordinary spots are vague, never discolorous in my experience, and I have seen many specimens.

Stigma is a Floridian form differing from all the preceding in lacking almost entirely the median lines, the ordinary spots whitish, blotchy and contrasting. In color it is a different shade of red, more admixed with yellow, and distinguishable at a glance.

These characters will serve to distinguish the forms, further details being given in the specific characterization.

Copipanolis borealis sp. nov.

Head, thorax, and median space of primaries umber brown, the latter powdery; basal and extra medial space pearl gray, powdery. T. a. line darker brown, not sharply defined; t. p. line broad, brown, distinct, evenly bisinuate. Ordinary spots moderate in size, vague, rather indefinitely outlined and with sparse pearl gray powderings. Secondaries blackish, apices gray powdered. Beneath gray, powdery, primaries smoky on disc, secondaries with a broad outer line.

Expands 28 millimetres = 1.12 inches.

HABITAT: Minnesota (St. Anthony Park), April 7, 1889.

Of this remarkable species, a single male specimen from Mr. Schoenborn's collection, taken by Mr. O. Luggler, is before me. In wing form, vestiture and pattern of ornamentation the resemblance to the described species is striking, while the entirely different coloration gives the insect a strangely unfamiliar appearance.

Copipanolis fasciata sp. nov.

General color of the entire insect a rusty red brown, secondaries slightly paler. The wings are powdered with somewhat deeper brown atoms, less dense beyond the t. p. line. Median lines single, broad, somewhat diffuse, deeper brown. T. a. line even, with a slight outcurve centrally. T. p. line rather evenly bisinuate, the curve a little broken opposite the cell. S. t. line wanting. A vague terminal line, sometimes entirely wanting. Ordinary spots vague, orbicular rarely traceable, never distinct, reniform vaguely marked, sometimes wanting entirely, usually noticeable as an indefinite dusky shade, never prominent. Beneath, the brown has a grayish tendency, the powdering more noticeable than above.

Expands 32 to 35 millimetres = 1.28 to 1.35 inches.

HABITAT: Missouri (C. V. R.), April; Texas, Belfrage, January and February. Ten specimens are in the U. S. National Museum.

This species is easily recognizable by its almost uniform coloration, the median lines forming the only obvious markings. It is the species usually marked *cubilis* in collections, but differs from that species by the broader, less pointed primaries and by lacking the differences in shade, and all trace of the s. t. line.

The species is perhaps the most common of all the forms belonging to the present series, the Belfrage material containing quite a number of them.

Copipanolis cubilis Grt.

1874. Grt., 6th Rept. Peab. Ac. Sci. App. 26, *Copipanolis*.

1874. Grt., Buff. Bull. II, Pl. 1, p. 6, *Copipanolis*.

The male has a stout bombyciform appearance, though of moderate size, resembling in this respect as well as in the ornamentation of the primaries, the European *Panolis piniperda*. Rich ochrey honey-brown; ornamentation simple. The two median lines are distinct, continued, rather diffuse, darker than the wing, the t. a. line perpendicular, waved superiorly, the t. p. line followed by a pale shade, very oblique, much produced superiorly on the costal nervules, bending inwardly to vein 2, and narrowing the median space below this to internal margin, running inferiorly nearly parallel with the t. a. line. Ordinary spots, more or less distinct, dirty whitish, or again hardly paler than the wing and yellowish, separate, ringed with reddish, the orbicular spherical, the reniform with a central stain, of the usual shape, well outwardly removed in position, subterminal space more brownish than the paler terminal space. Hind wings pale fuscous, with a reddish tint. Beneath pale, with an even reddish band and discal spot on hind wings. Thorax and head concolorous with primaries above; abdomen dark. Expanse 36 millimetres.

HABITAT: Lansing, Mich., March 26th; Massachusetts.

The above description is Mr. Grote's original characterization, and the figure given by him in Buff. Bull. II, agrees with it very well.

I have seen the type in the British Museum and find that it agrees well with the figure and description; also that the Texan form is specifically distinct.

Copipanolis stigma Smith.

1890. Smith, Ent. Amer., VI, 220, *Copipanolis*.

Head, thorax, and primaries deep brick red; palpi paler. Primaries with a slight admixture of yellowish scales, most evident along costal region. Median lines vaguely marked, scarcely defined; ordinary spots yellowish white; orbicular small, round; reniform moderate in size, rather irregular. Secondaries whitish at base, with reddish powderings, becoming more dense outwardly. Beneath somewhat paler than above, more obviously yellow powdered.

Expands 29 millimetres = 1.15 inches.

HABITAT: Florida.

This species, of which I have seen a single male only, differs from the others in the almost total obsolescence of the median lines and the distinctness of the ordinary spots. The latter may, however, be unimportant and variable. There is a more decided yellow admixture in the ground color than is found in the common species.

LIST OF THE SPECIES.

DICOPIS Grt.

Copivaleria Grt.*grotei* Morr.*viridescens* Wlk.*muralis* Grt.*electilis* Morr.*thaxterianus* Grt.

EUTOLYPE Grt.

bombyciformis Smith.*depilis* Grt.*rolandi* Grt.*vernalis* Morr.*damalis* Grt.

COPIPANOLIS Grt.

borealis Smith.*fasciata* Smith.*cubilis* Grt.*stigma* Smith.